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EXAMINER

SINES, BRIAN J

ART UNIT

PAPER NUMBER

1743

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/647,871

Applicant(s)

BALISKY, TODD ALAN

Examiner

Brian J. Sines

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-77 is/are pending in the application.
- 4a) Of the above claim(s) 76 and 77 is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-75 is/are rejected.
- 7) ☒ Claim(s) 9 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). ____.
- 2) ☒ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 3. 6) ☐ Other: _____

DETAILED ACTION

Election/Restrictions

Restriction is required under 35 U.S.C. 121 and 372.

This application contains the following inventions or groups of inventions which are not so linked as to form a single general inventive concept under PCT Rule 13.1.

In accordance with 37 CFR 1.499, applicant is required, in reply to this action, to elect a single invention to which the claims must be restricted.

Group I, claim(s) 1 – 75, drawn to a chemical control system and method for using the chemical control system.

Group II, claim(s) 76 and 77, drawn to a fitting for coupling tubing.

The inventions listed as Groups I and II do not relate to a single general inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, they lack the same or corresponding special technical features for the following reasons: In the instant case, the different inventions comprising the chemical control system and the fitting for coupling tubing have different modes of operation and function, and are structurally unrelated.

During a telephone conversation with Raphael A. Monsanto on 12/13/2002 a provisional election was made with traverse to prosecute the invention of group I, claims 1 – 75. Affirmation of this election must be made by applicant in replying to this Office action. Claims 76 and 77 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

Claim Objections

Claim 9 is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. It should be noted that claim 9 is directed to a system or apparatus. Therefore, it is the structural limitations of the apparatus, as recited in the claim, which are considered in determining the patentability of the apparatus comprising the system. It is unclear as to how the recitation of the intended use further limits the structure of the apparatus comprising the chemical control system. Claim 9 recites process or use limitations, which are accorded no patentable weight to claims to an apparatus. For example, claim 9 recites how the apparatus is to be operated or what is intended to be used with the apparatus, such as a specific chemical solution or slurry with its associated characteristics, which do not impart any limitations to define the structure of the apparatus being claimed. Process limitations do not add patentability to a structure, which is not distinguished from the prior art. A recitation of the intended use of the claimed invention must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim. In a claim drawn to a process of making, the intended use must result in a manipulative difference as compared to the prior art. See *In re Casey*, 152 USPQ 235 (CCPA 1967) and *In re Otto*, 136 USPQ 458, 459 (CCPA 1963).

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 9 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. It should be noted that claim 9 is directed to a system or apparatus. Therefore, it is the structural limitations of the apparatus, as recited in the claims, which are considered in determining the patentability of the apparatus comprising the system. It is unclear as to how the recitation of the intended use recited in claim 9 further limits the structure of the apparatus comprising the chemical control system. Claim 9 recites process or use limitations, which are accorded no patentable weight to claims to an apparatus. For example, claim 9 recites how the apparatus is to be operated or what is intended to be used with the apparatus, such as a specific chemical solution or slurry with its associated characteristics, which do not impart any limitations to define the structure of the apparatus being claimed. Process limitations do not add patentability to a structure, which is not distinguished from the prior art. A recitation of the intended use of the claimed invention must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim. In a claim drawn to a process of making, the intended use must result in a manipulative difference as compared to the

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prior art. See *In re Casey*, 152 USPQ 235 (CCPA 1967) and *In re Otto*, 136 USPQ 458, 459 (CCPA 1963).

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 5 and 9 are rejected under 35 U.S.C. 102(b) as being anticipated by Gasper (U.S. Pat. No. 4,631,530). As shown in figure 1, Gasper teaches a chemical control system comprising: an analyzer (electrical sensor, 98); a sample delivery arrangement (monitoring line, 100) for delivering to the analyzer (98) a sample of a chemical solution; a controller (96); and a replenisher (pump, 90), which is responsive to the controller (96) for dispensing a controlled quantity of a predetermined chemical constituent (col. 5, lines 30 – 68; figure 1). Regarding claim 5, Gasper teaches the use of a pH electrode (col. 5, lines 30 – 40). Regarding claim 9, it should be noted that these claims are directed to a system or apparatus. Therefore, it is the structural limitations of the apparatus, as recited in the claims, which are considered in determining the patentability of the apparatus comprising the system. Claim 9 recites process or use limitations, which are accorded no patentable weight to claims to an apparatus. For example, claim 9 recites how the apparatus is to be operated or what is intended to be used with the apparatus, such as a specific chemical solution or slurry with its associated characteristics, which do not impart any limitations to define the

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structure of the apparatus being claimed. Process limitations do not add patentability to a structure, which is not distinguished from the prior art. A recitation of the intended use of the claimed invention must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim. In a claim drawn to a process of making, the intended use must result in a manipulative difference as compared to the prior art. See *In re Casey*, 152 USPQ 235 (CCPA 1967) and *In re Otto*, 136 USPQ 458, 459 (CCPA 1963).

Claims 1 – 3, 5, 7 and 9 are rejected under 35 U.S.C. 102(b) as being anticipated by Ishikawa (U.S. Pat. No. 4,203,156). Regarding claim 1, Ishikawa teaches a chemical control system comprising: an analyzer (detecting electrode, 6); a sample delivery arrangement (titration vessel, 2) for delivering to the analyzer (6) a sample of a chemical solution (4); a controller (computer, 33); and a replenisher (titration cylinder, 46), which is responsive to the controller (33) for dispensing a controlled quantity of a predetermined chemical constituent (liquid titrant) (col. 10, lines 53 – 68; col. 11, lines 1 – 25; figure 5). Regarding claim 2, Ishikawa teaches that the analyzer is a titrator system (col. 10, lines 53 – 66). Regarding claim 3, Ishikawa teaches that the analyzer system may further comprise a compartment or reaction cell (1) for receiving a sample of the chemical solution from the analyzer sample delivery arrangement (2); and a sensor (5,6) for measuring selectably a predetermined characteristic of the chemical solution (4). Regarding claim 5 and 7, Ishikawa teaches the use of a pH electrode and

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an ion selective electrode (col. 3, lines 50 – 62). Regarding claim 9, it should be noted that these claims are directed to a system or apparatus. Therefore, it is the structural limitations of the apparatus, as recited in the claims, which are considered in determining the patentability of the apparatus comprising the system. Claim 9 recites process or use limitations, which are accorded no patentable weight to claims to an apparatus. For example, claim 9 recites how the apparatus is to be operated or what is intended to be used with the apparatus, such as a specific chemical solution or slurry with its associated characteristics, which do not impart any limitations to define the structure of the apparatus being claimed. Process limitations do not add patentability to a structure, which is not distinguished from the prior art. A recitation of the intended use of the claimed invention must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim. In a claim drawn to a process of making, the intended use must result in a manipulative difference as compared to the prior art. See *In re Casey*, 152 USPQ 235 (CCPA 1967) and *In re Otto*, 136 USPQ 458, 459 (CCPA 1963).

Claims 1 – 7 and 9 are rejected under 35 U.S.C. 102(b) as being anticipated by Onofusa et al. (U.S. Pat. No. 5,186,895A). Regarding claim 1, Onofusa et al. teach a chemical control system comprising: an analyzer (microcomputer, micom); a sample delivery arrangement (P-1) for delivering to the analyzer a sample of a chemical solution; a controller (PC); and a replenisher (P-2), which is responsive to the controller

(PC) for dispensing a controlled quantity of a predetermined chemical constituent (col. 4, lines 13 – 65; col. 5, lines 11 – 29; figure 1). Regarding claim 2, Onofusa et al. teach that the analyzer is a titrator system (col. 9, lines 8 – 15). Regarding claim 3, Onofusa et al. teach that the analyzer system may further comprise a compartment or reaction cell (R) for receiving a sample of the chemical solution from the analyzer sample delivery arrangement (2); and a sensor (ORP electrode) for measuring selectably a predetermined characteristic of the chemical solution. Regarding claim 4, Onofusa et al. teach that the reaction cell comprises a glass beaker (R) (col. 5, lines 14 – 29). Regarding claim 5 and 7, Onofusa et al. anticipate the use of a pH electrode and an ion selective electrode (col. 9, lines 8 – 40). Regarding claim 6, Onofusa et al. teach the use of an ORP electrode (col. 5, lines 14 – 29). Regarding claim 9, it should be noted that these claims are directed to a system or apparatus. Therefore, it is the structural limitations of the apparatus, as recited in the claims, which are considered in determining the patentability of the apparatus comprising the system. Claim 9 recites process or use limitations, which are accorded no patentable weight to claims to an apparatus. For example, claim 9 recites how the apparatus is to be operated or what is intended to be used with the apparatus, such as a specific chemical solution or slurry with its associated characteristics, which do not impart any limitations to define the structure of the apparatus being claimed. Process limitations do not add patentability to a structure, which is not distinguished from the prior art. A recitation of the intended use of the claimed invention must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from

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the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim. In a claim drawn to a process of making, the intended use must result in a manipulative difference as compared to the prior art. See *In re Casey*, 152 USPQ 235 (CCPA 1967) and *In re Otto*, 136 USPQ 458, 459 (CCPA 1963).

Claims 1 – 9 are rejected under 35 U.S.C. 102(b) as being anticipated by Becket (U.S. Pat. No. 5,389,546A). Regarding claim 1, Becket teaches a chemical control system comprising: an analyzer (23); a sample delivery arrangement (34) for delivering to the analyzer a sample of a chemical solution (31); a controller (23); and a replenisher (28), which is responsive to the controller (23) for dispensing a controlled quantity of a predetermined chemical constituent (titrant, 37) (col. 10, lines 20 – 68; col. 11, lines 1 – 65; figure 1). Regarding claim 2, Becket teaches that the analyzer is a titrator system (col. 3, lines 47 – 66). Regarding claim 3, Becket teaches that the analyzer system may further comprise a compartment or reaction cell (R) for receiving a sample of the chemical solution from the analyzer sample delivery arrangement (34); and a sensor (electrode, 17 & 22) for measuring selectably a predetermined characteristic of the chemical solution. Regarding claim 4, Becket teaches the use of a glass beaker (col. 4, lines 1 – 47). Regarding claim 5 and 7, Becket teaches the use of a pH electrode and anticipate the use of an ion selective electrode and an ORP electrode (col. 4, lines 1 – 68; col. 10, lines 20 – 40). Regarding claim 8, Becket anticipates the incorporation of a turbidity sensor (col. 15, lines 21 – 58). Regarding claim 9, it should be noted that these claims are directed to a system or apparatus. Therefore, it is the structural limitations of

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the apparatus, as recited in the claims, which are considered in determining the patentability of the apparatus comprising the system. Claim 9 recites process or use limitations, which are accorded no patentable weight to claims to an apparatus. For example, claim 9 recites how the apparatus is to be operated or what is intended to be used with the apparatus, such as a specific chemical solution or slurry with its associated characteristics, which do not impart any limitations to define the structure of the apparatus being claimed. Process limitations do not add patentability to a structure, which is not distinguished from the prior art. A recitation of the intended use of the claimed invention must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim. In a claim drawn to a process of making, the intended use must result in a manipulative difference as compared to the prior art. See *In re Casey*, 152 USPQ 235 (CCPA 1967) and *In re Otto*, 136 USPQ 458, 459 (CCPA 1963).

Claims 1 – 6, 9 – 18, 22 – 52, 55 – 59, 62 and 63 are rejected under 35 U.S.C. 102(b) as being anticipated by Sakisako et al. (U.S. Pat. No. 4,749,552). Regarding claims 1 and 27, Sakisako et al. teach an automatic titration apparatus comprising: an analyzer (S & A); a precision analyzer sample delivery arrangement (1); a controller (C); and a replenisher (col. 3, lines 4 – 45; figure 1). Regarding claim 2, Sakisako et al. teach that the analyzer comprises a titrator system (T) (col. 3, lines 19 – 24). Regarding claims 3 and 27, the system comprises a reaction cell (2 & 9).

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Regarding claim 4, Sakisako et al. anticipate that the vessel or reaction cell (9) may comprise a beaker (col. 3, lines 25 – 32). Regarding claims 5 and 28, Sakisako et al. teach the use of a pH electrode (11) (col. 3, lines 25 – 41). Regarding claims 6 and 28, Sakisako et al. teach the use of an oxidation-reduction potential measuring electrode (12) (col. 3, lines 25 – 41). Regarding claim 9, it should be noted that these claims are directed to a system or apparatus. Therefore, it is the structural limitations of the apparatus, as recited in the claims, which are considered in determining the patentability of the apparatus comprising the system. Claim 9 recites process or use limitations, which are accorded no patentable weight to claims to an apparatus. For example, claim 9 recites how the apparatus is to be operated or what is intended to be used with the apparatus, such as a specific chemical solution or slurry with its associated characteristics, which do not impart any limitations to define the structure of the apparatus being claimed. Process limitations do not add patentability to a structure, which is not distinguished from the prior art. A recitation of the intended use of the claimed invention must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim. In a claim drawn to a process of making, the intended use must result in a manipulative difference as compared to the prior art. See *In re Casey*, 152 USPQ 235 (CCPA 1967) and *In re Otto*, 136 USPQ 458, 459 (CCPA 1963). Regarding claim 10, Sakisako et al. teach a global loop for distributing a chemical solution (see section S of figure 1). Regarding claims 11 – 17, Sakisako et al. teach all of the structural limitations

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as recited by these instant claims. Sakisako et al. teach that the controller (15) of the control mechanism (C) comprises a display (col. 3, lines 42 – 45). Regarding claim 16, Sakisako et al. teach a chemical sensor (11 & 12) (col. 3, lines 25 – 45). Regarding claim 17, Sakisako et al. teach that the system comprises a chemical tank (9) (col. 3, lines 4 – 18). Regarding claims 18 and 29, Sakisako et al. teach that the system comprises a liquid level monitoring or proximity arrangement (10) (col. 3, lines 46 – 51). Regarding claim 22, the sample delivery arrangement comprises an eductor (1 & 3) for drawing a sample to the analyzer. Regarding claims 23 and 24, Sakisako et al. teach a purge system comprising air pump (13) and solenoid valve (SV3) (col. 3, lines 36 – 41). Regarding claims 25 and 26, Sakisako et al. teach that the purge system additionally comprises a rinse solvent purge valve controlling a rinse solvent, such as tap water, for clearing the analysis system (col. 5, lines 5 – 34). Regarding claim 30, Sakisako et al. teach that the sample delivery arrangement comprises a burette or syringe (col. 3, lines 4 – 24). Regarding claim 31, Sakisako et al. teach the use of a controllable drive (22 & 23) for driving the burette or syringe (col. 3, lines 52 – 67). Regarding claim 32, Sakisako et al. teach the use of a stepper motor drive (35) (col. 4, lines 1 – 24). Regarding claim 33, as shown in figure 1, Sakisako et al. teach that the replenisher (1) is arranged to deliver a controlled quantity of the predetermined chemical constituent to a storage tank (4) containing the chemical solution. Regarding claims 34 and 35, Sakisako et al. teach that the system comprises a cleanup arrangement or purge system comprising air pump (13) and solenoid valve (SV3) (col. 3, lines 36 – 41; col. 5, lines 5 – 34). Regarding claim 36, Sakisako et al. teach that the cleanup arrangement

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or purge system additionally comprises a rinse solvent purge valve controlling a rinse solvent, such as tap water, for clearing the analysis system (col. 5, lines 5 – 34).

Regarding claim 37, Sakisako et al. teach that the cleanup arrangement comprises a syringe cycling arrangement for cycling for cycling a sample syringe or burette. until the burette is cleared of a prior sample (col. 5, lines 5 – 35). Regarding claim 38, Sakisako et al. teach a method of analysis comprising the steps of: delivering a sample to an analysis cell; performing a titration analysis, wherein the titration analysis comprises the steps of: controlling a syringe or burette to deliver a titrant to a chemical solution; monitoring a predetermined chemical characteristic of the chemical solution during the performance of the titration analysis; determining an endpoint of the titration analysis; and finally conducting a cleanup procedure of the titration analysis system (col. 2, line 40 – col. 5, line 57). Regarding claim 39, Sakisako et al. teach a method step of delivering a predetermined sample quantity of a chemical solution to the sample cell (col. 3, lines 4 – 18). Regarding claim 40, Sakisako et al. teach a method step of cycling a sample syringe or burette (col. 3, lines 4 – 18; col. 5, lines 5 – 34). Regarding claims 41 and 42, Sakisako et al. teach a method step of adjusting the rate at which the titration analysis is performed (col. 6, lines 5 – 23). Regarding claims 43, Sakisako et al. teach a methodology of purging and cleaning the analysis cell (col. 3, lines 25 – 32; col. 5, lines 5 – 34). Regarding claim 44, Sakisako et al. teach a method step of using a level sensor for detecting and confirming the delivery of all reagents to the analysis cell (col. 3, lines 25 – 51). Regarding claim 45, Sakisako et al. teach a methodology of delivering each chemical solution required for the titration analysis by timing the delivery

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of each solution (col. 7, lines 17 – 35). Regarding claim 46, Sakisako et al. teach delivering a conditioning reagent (col. 5, lines 35 – 47). Regarding claim 47, Sakisako et al. further teach the use of a gravity feed arrangement (16) (col. 4, line 65 – col. 5, line 3). Regarding claims 48 and 49, Sakisako et al. teach the further steps of delivering a conditioning reagent using a pump, controlling a syringe or burette using a stepper motor drive (col. 3, lines 46 – 68; col. 4, lines 1 – 24; col. 6, lines 5 – 23). Regarding claims 50 – 52, Sakisako et al. teach a methodology of taking analog readings of a predetermined chemical characteristic and determining an end-point of each titration analysis (col. 4, lines 41 – 64). Regarding claims 55 – 59, Sakisako et al. teach the use of a gas purge for sample agitation and for cycling a syringe or burette (col. 3, lines 32 – 41; col. 5, lines 5 – 34). Regarding claims 62 and 63, Sakisako et al. teach the methodology of performing a differential titration analysis using an ORP electrode (col. 6, lines 5 – 23; col. 6, line 65 – col. 7, line 16).

Claims 68, 69 and 73 – 75 are rejected under 35 U.S.C. 102(b) as being anticipated by Entwistle (U.S. Pat. No. 4,668,346). Regarding claim 68, Entwistle teaches a method for performing an ion selective analysis, wherein the method comprises the steps of: delivering a sample to an analysis cell; performing an ion selective analysis on the chemical solution; measuring the electrode potential value of an ion selective electrode; and determining a quantity of an analyte in the chemical solution (col. 1, lines 1 – col. 4, line 49). Regarding claim 69, Entwistle anticipates the multi-addition of a predetermined amount of a standard solution comprising between 2

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and 6 predetermined amounts of the standard solution (col. 1, lines 40 – 68).

Regarding claim 73, Entwistle anticipates a step of reducing the rate at which the delivery of the predetermined amounts a standard solution is performed (col. 1, lines 1 – 65).

Regarding claims 74 and 75, Entwistle anticipates the step of extrapolating a plurality of the measured electrode potential values back to the point of zero analyte concentration (col. 7, lines 57 – 64; figure 2).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 19 – 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sakisako et al. as applied to claims 1 – 6, 9 – 18, 22 – 52, 62 and 63 above, and further in view of Suthergreen et al. (U.S. Pat. No. 5,351,725A). Regarding claim 19, Sakisako

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et al. do not specifically teach the use of a liquid level monitoring arrangement which comprises a pressure monitoring system. Sakisako et al. do teach the use of a level switch (10) connected to the central processing unit (17). The control mechanism (C) comprises a control unit (15) further comprising the central processing unit (17). The control unit (15) comprises a microcomputer, a display and a transducer (col. 3, 42 – 59). Suthergreen et al. teach a cost-effective, accurate and reliable system of measuring the quantity of liquids in storage tanks (col. 2, lines 55 – 59). Suthergreen et al. do teach the use of a pressure transducer (58) involved in the monitoring of the quantity and other characteristics of liquid in tank (48) (col. 5, lines 35 – 68; col. 6, lines 1 – 49). Suthergreen et al. teach that the airbell structure (52) involved in pressure sensing comprises a plastic tubing (col. 6, lines 3 – 59; figure 4). Therefore, it would have been obvious to one of ordinary skill in the art to incorporate the liquid level sensing system with its associated benefits, as taught by Suthergreen et al., with the apparatus of Sakisako et al., in order to provide for a more effective liquid level monitoring arrangement. Regarding claims 20 and 21, the pressure that is delivered to the liquid level monitoring arrangement is considered a result effective variable whose determination would have been within the ambit of one of ordinary skill in the art without undue experimentation. The Courts have held that the discovery of an optimum value of a result effective variable, without producing any new or unexpected results, is within the routine skill of one of ordinary skill in the art. See *In re Boesch*, 205, USPQ 215 (CCPA 1980).

Claims 53, 54, 60 and 61 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sakisako et al. (U.S. Pat. No. 4,749,552). Regarding claims 53 and 54 Sakisako et al. do not specifically teach that the end-point of the titration analysis is repeated between approximately 2 and 9 times. However, it is notoriously well known in the art of laboratory experimentation to perform experiments a number of times in order to verify experimental data. Regarding claims 60 and 61, Sakisako et al. do not specifically teach the steps involved in calibrating a pH electrode prior to use. However, the calibration of pH electrodes are notoriously well known in the art. Therefore, it would have been obvious to one of ordinary skill in the art to calibrate the pH electrode as taught by Sakisako et al. prior to use.

Claims 8, 64 and 67 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sakisako et al. as applied to claims 1 – 6, 9 – 18, 22 – 52, 62 and 63 above, and further in view of Janzen (U.S. Pat. No. 4,095,272). Sakisako et al. do not specifically teach the use of a turbidity sensor in determining the end-point of a titration analysis. Sakisako et al. do teach that the disclosed system and method may be used to perform a titration analysis where the optical properties of the sample are changed by the titration of a reagent (col. 1, lines 30 – 43). Janzen teaches an automatic turbidometric titration system and method. Janzen recognizes that the accuracy of a titration analysis can be enhanced through the use of turbidity detection when the equivalence point for a chemical system under titration analysis experiences a turbidity maximum (col. 1, lines 1 – 44). Therefore, it would have been obvious to one of ordinary skill in the art to

incorporate the apparatus and methodology of automatic turbidometric titration analysis, as taught by Janzen, with the automatic titration system and method, as taught by Sakisako et al., in order to provide for an effective system and method of titrating chemical systems susceptible to turbid conditions.

Claims 65 and 66 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sakisako et al. and Janzen as applied to claims 8, 64 and 67 above, and further in view of Nagy et al. (U.S. Pat. No. 4,120,657). Sakisako et al. and Janzen are silent to the teaching of titrating a solution of unknown cyanide concentration. Sakisako et al. do teach that the automatic titration apparatus may be utilized in the titration analysis of industrial waste water (col. 1, lines 30 – 43). Nagy et al. do teach the analysis of the cyanide concentration using silver ion in an industrial sewage (col. 7, lines 26 – 60). Therefore, it would have been obvious to one of ordinary skill in the art to combine the teachings of Sakisako et al. and Janzen with the titration analysis methodology of Nagy et al. in order to effectively determine the concentration of cyanide in the waste water.

Claims 70 – 72 are rejected under 35 U.S.C. 103(a) as being unpatentable over Entwistle. Entwistle does not further specifically teach that the electrode potential differences between successive measurements is approximately between either 3 – 40 mV, 5 – 30 mV, or approximately 20 mV. As shown in figure 2, Entwistle do teach a theoretical response curve of the ion selective electrode. The electrode potential

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difference between the successive measurements is considered a result effective variable whose determination would have been obvious to one of ordinary skill in the art. The Courts have decided that the discovery of an optimum value of a known result effective variable, without producing any new or unexpected results, is within the skill of one of ordinary skill in the art. See *In re Boesch*, 205 USPQ 215 (CCPA 1980).

Conclusion

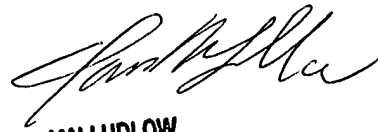
The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Watts et al. teach an automatic chemistry analyzer. Tittle teaches a chemical process control system. Eppstein et al. teach an endpoint drift correction for automatic titration analysis.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Brian J. Sines whose telephone number is (703) 305-0401. The examiner can normally be reached on Monday - Friday (11:30 AM - 8 PM EST).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jill A. Warden can be reached on (703) 308-4037. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9310 for regular communications and (703) 872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

BJS
December 16, 2002


JAN LUDLOW
PRIMARY EXAMINER